

PATENT CLAIMS

1. Fillable cushion (20, 21, 30, 31) for the protection of four corners, two edges and a surface area of an essentially cuboidal article (19) to be packed, the cushion comprising at least two layers of plastic films (22, 23), characterized in that the cushion has near its longitudinal ends in each case a recess, by means of which the cushion can be pushed onto at least one corner of the cuboidal article (19), the cushion being dimensioned in such a way that its longitudinal extent between the two recesses corresponds to the length of the two edges to be protected plus the length of the diagonal of the surface area to be protected.
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2. Cushion according to Claim 1, characterized in that the cushion comprises a number of part-cushions (16, 17, 26), in particular with chambers that are separate from one another.
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3. Cushion according to Claim 1 or 2, characterized in that respectively provided for the edge to be protected is a part-cushion (16, 26), which has a recess by which the part-cushion can be fitted onto the edge to be protected.
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4. Cushion according to Claim 3, characterized in that the two part-cushions (16) are connected to one another by a band (18).
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5. Cushion according to Claim 3, characterized in that the two part-cushions (26) are connected to one another by a further part-cushion (27).
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6. Cushion according to one of Claims 3 to 5, characterized in that, in the case of at least one part-cushion (26) for one edge, the recess has a smaller width in the centre than at the ends.
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7. Cushion according to one of Claims 2 to 6, characterized in that one part-cushion (27) has at least one recess which is adapted in its shape to further articles to be received in it, such as accessory parts for the article (19).

8. Use of a cushion (20, 21, 30, 31) according to one of Claims 1 to 7 for packing a cuboidal article (19), one longitudinal end being pushed with the recess at least onto a first corner of a first surface area of the article, the cushion being placed from the first corner along a first edge, diagonally over a second surface area, which lies opposite the first surface area, to and along a second edge, which leads to the second corner, and the other longitudinal end being pushed with its recess onto at least one second corner, which lies diagonally opposite the first corner on the first surface area.
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9. Method for fabricating fillable cushions (1, 20, 21, 30, 31), in particular inflatable cushions, in particular cushions according to one of Claims 1 to 7, in which at least two layers of plastic films (22, 23) are welded to one another by means of ultrasound (4) along a contour of the cushion in such a way that a fillable cavity is produced, characterized in that in the case of curved contours, a sonotrode (5) is rotated about an axis perpendicular to the welding plane in such a way that the sonotrode is aligned tangentially in relation to the contour.
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10. Method according to Claim 9, characterized in that, to produce the welding, a sonotrode (5) is moved along the contour of the cushion, in particular linearly in three spatial axes.
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11. Method according to Claim 9 or 10, characterized in that the movement of the sonotrode (5) is electronically controlled on the basis of any given contour.
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12. Method according to one of Claims 9 to 11, characterized in that the contact pressure with which the sonotrode (5) is pressed against the plastic films (22, 23) is regulated.
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13. Method according to one of Claims 9 to 12, characterized in that a perforation (15) or a severing cut is produced in the plastic film (22, 23) by the sonotrode (5).

5 14. Method according to one of Claims 9 to 13, characterized in that, before or after the welding, at least one plastic film (22, 23) is given at least one punched clearance for each cushion.

10 15. Apparatus for fabricating fillable cushions (1, 20, 21, 30, 31), in particular inflatable cushions, comprising at least one ultrasonic welding device (4) for welding at least two layers of plastic films (22, 23) along a contour of the cushion, characterized in that the sonotrode (5) is rotatable about an axis perpendicular to the welding plane, so that the sonotrode can be 15 aligned tangentially in relation to a curved contour during the welding.

20 16. Apparatus according to Claim 15, characterized in that the sonotrode (5) of the ultrasonic welding device (4) is linearly movable in three spatial axes.

25 17. Apparatus according to Claim 15 or 16, characterized in that a device for electronically controlling the movement of the sonotrode (5) on the basis of any given contour is provided.

30 18. Apparatus according to one of Claims 15 to 17, characterized in that a device for regulating the contact pressure with which the sonotrode (5) is pressed against the plastic films (22, 23) is provided.

35 19. Apparatus according to one of Claims 15 to 18, characterized in that the sonotrode (5) has a number of blades.

20. Apparatus according to one of Claims 15 to 19, characterized in that a punching device (24, 25) is provided, by which at least one

plastic film (22, 23) receives at least one punched clearance (7) for each cushion before or after the welding.

21. Use of an apparatus according to one of Claims 15 to 20 for

5 fabricating fillable cushions, in particular inflatable cushions, which comprise two layers of plastic films (22, 23).

22. Fillable cushion (1, 20, 21, 30, 31) in which at least two plastic

films (22, 23) are welded to one another along a contour of the

10 cushion in such a way that a fillable cavity is produced, the weld seam (3) being interrupted at one location for the purpose of filling, characterized in that an opening (7) for the filling of the cushion is provided in at least one plastic film (22, 23), outside the fillable cavity in the region of the interrupted

15 location, tangentially in relation to the contour of the cushion.

23. Method for filling empty cushions comprising plastic films (22,

23) with gas, characterized in that at least one nozzle (8) is arranged at a distance from an opening (7), in particular a

20 punched clearance, in one of the plastic films (22, 23) of the cushion, obliquely in relation to the surface area of the cushion, and gas is blown out of this nozzle onto the opening and that the nozzle (8) is pivoted and/or the distance from the opening (7) is changed.

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24. Method according to Claim 23, characterized in that the nozzle (8) forms an angle of between 5° and 60°, preferably between 15° and 40°, with the plane (29) of the empty cushion.

30 25. Method according to Claim 23 or 24, characterized in that a predetermined amount of gas is blown out for each opening (7).

26. Method according to one of Claims 23 to 25, characterized in that the cushion is stably held at at least two points during the

35 inflation.

27. Method according to one of Claims 23 to 26, characterized in that the cushion is closed by means of welding.

5 28. Method according to Claim 27, characterized in that the location of the cushion that is to be welded is rendered pressureless during the welding.

10 29. Apparatus for filling empty cushions comprising plastic films with gas, characterized in that at least one nozzle (8) is arranged at a distance from a bearing surface (29) for the empty cushion, obliquely in relation to the bearing surface, so that gas can be blown out of this nozzle onto an opening (7), in particular a punched clearance, in one of the plastic films (22, 23) of the cushion and that the nozzle (8) is pivotable and/or movable in 15 relation to the bearing surface (29).

20 30. Apparatus according to Claim 29, characterized in that the nozzle (8) forms an angle of between 5° and 60°, preferably between 15° and 40°, with the bearing surface (29).

25 31. Apparatus according to Claim 29 or 30, characterized in that a device with which a predetermined amount of gas can be blown out for each opening (7) is provided.

32. Apparatus according to one of Claims 29 to 31, characterized in that a holding device with which the cushion (1) can be stably held at at least two points during the inflation is provided.

33. Apparatus according to one of Claims 29 to 32, characterized in that a welding device (11) with which the cushion (1) can be closed after the inflation is provided.

34. Apparatus according to Claim 33, characterized in that a device (12) with which the location of the cushion (1) that is to be welded can be rendered pressureless during the welding is provided.

35. Use of an apparatus according to one of Claims 29 to 34 for
filling empty cushions comprising plastic films (22, 23) with gas.